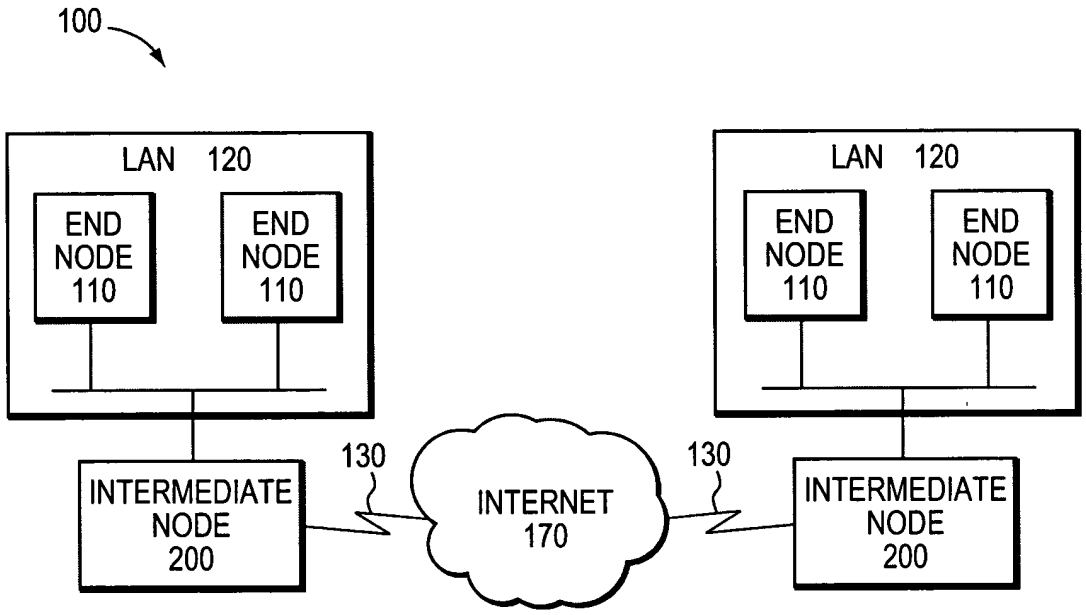
100
LAN 120
END NODE 110
END NODE 110
LAN 120
END NODE 110
END NODE 110
INTERMEDIATE NODE 200
130
INTERNET 170
130
INTERMEDIATE NODE 200

FIG. 1

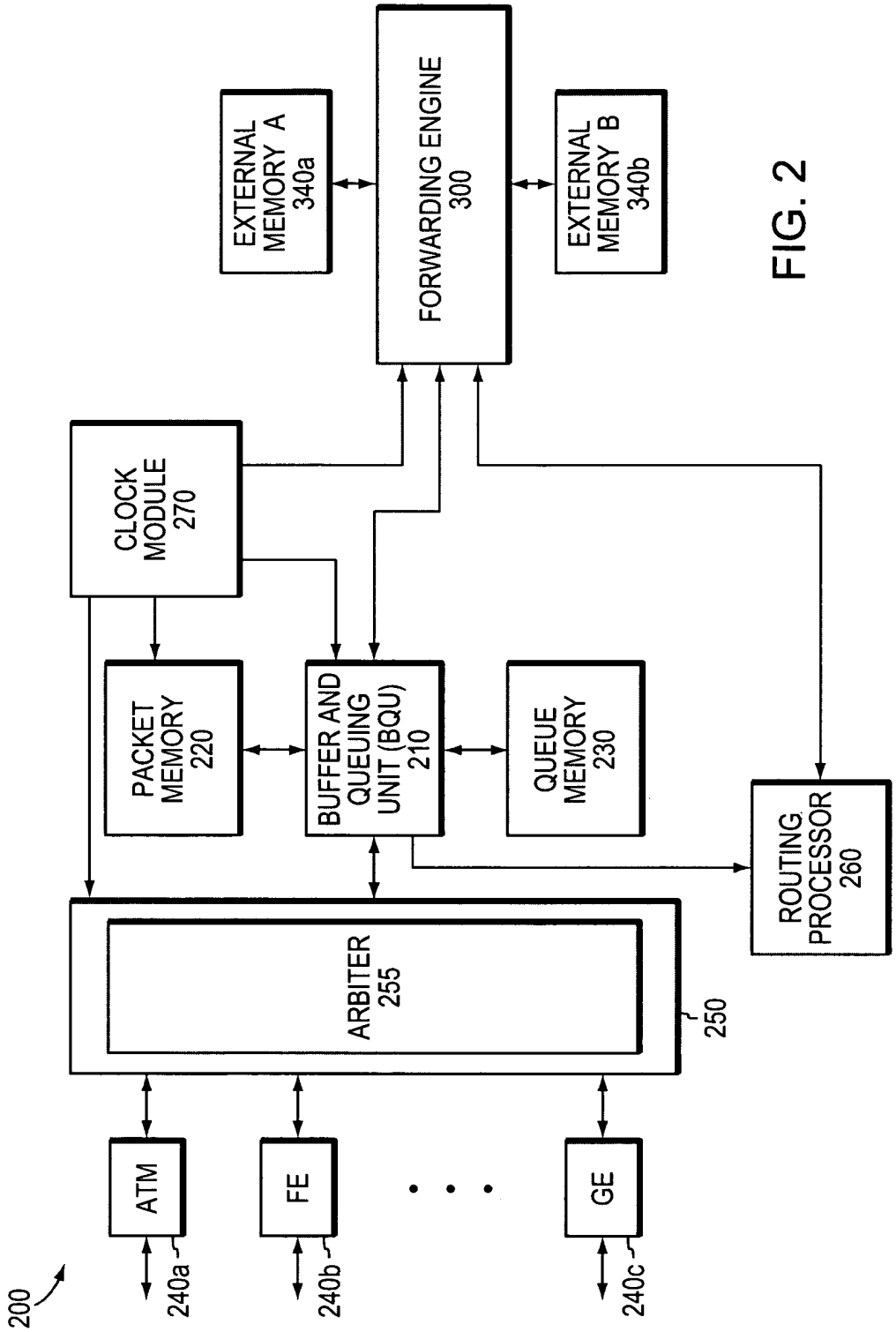
EXTERNAL MEMORY A 340a
FORWARDING ENGINE 300
EXTERNAL MEMORY B 340b
CLOCK MODULE 270
PACKET MEMORY 220
BUFFER AND QUEUING UNIT (BQU) 210
QUEUE MEMORY 230
ROUTING PROCESSOR 260
ARBITER 255
250
ATM
FE
GE
200
240a
240b
240c

FIG. 2

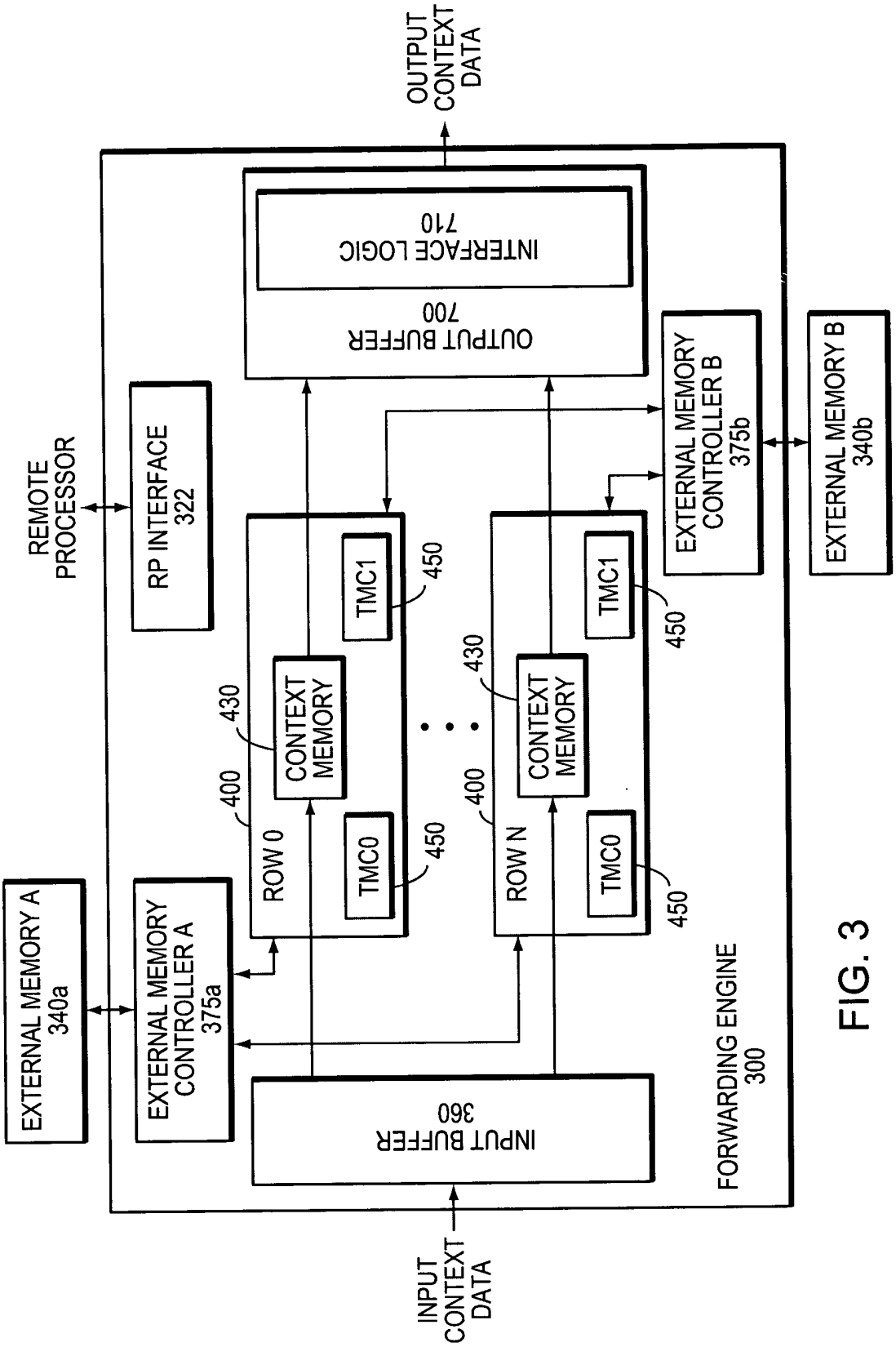
OUTPUT CONTEXT DATA
INTERFACE LOGIC 710
OUTPUT BUFFER 700
REMOTE PROCESSOR
RP INTERFACE 322
EXTERNAL MEMORY CONTROLLER B 375b
EXTERNAL MEMORY B 340b
TMC1
450
CONTEXT MEMORY
430
400
ROW 0
TMC0
450
ROW N
EXTERNAL MEMORY A 340a
EXTERNAL MEMORY CONTROLLER A 375a
INPUT BUFFER 360
FORWARDING ENGINE 300
INPUT CONTEXT DATA

FIG. 3

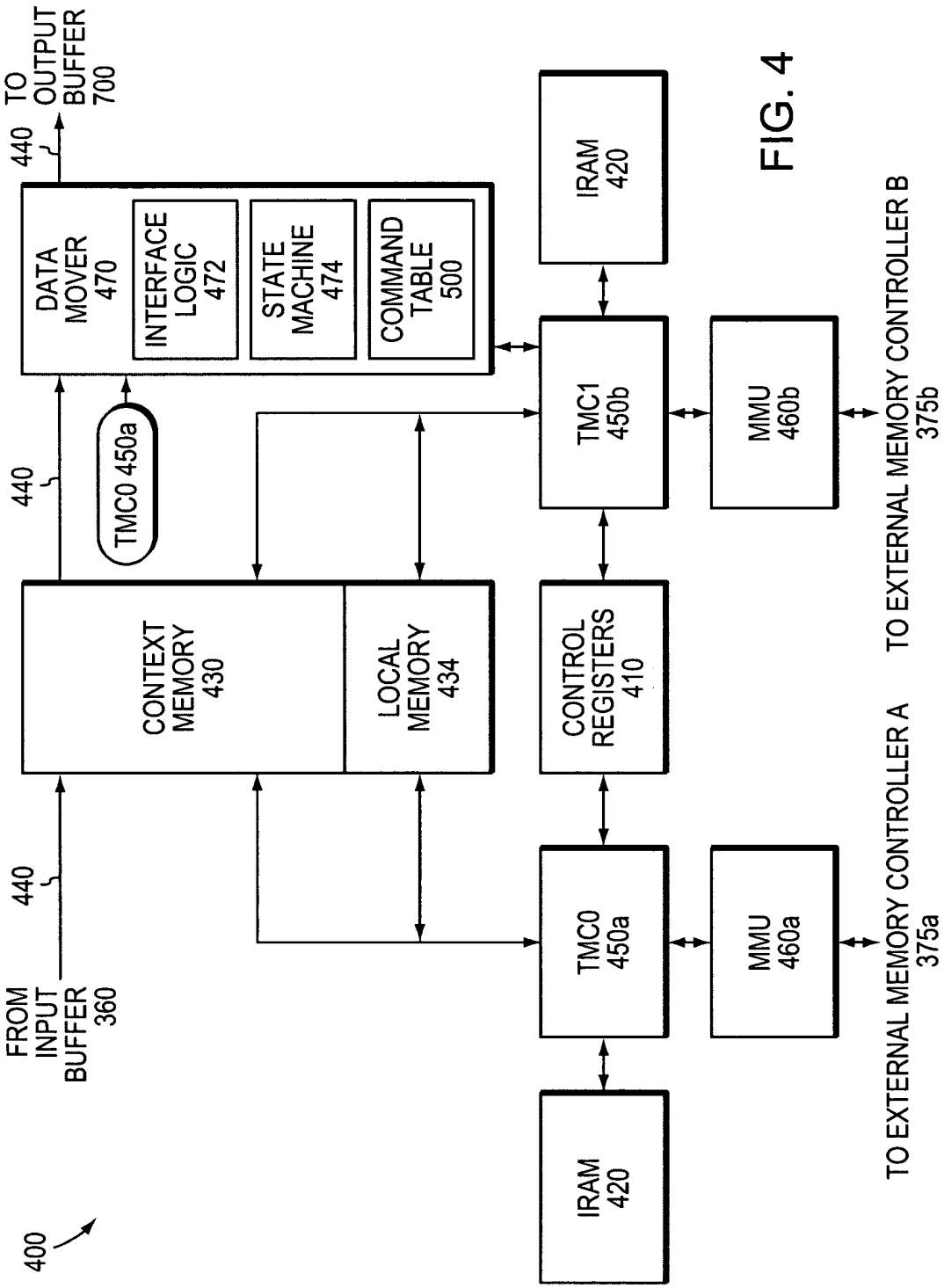
400
FROM INPUT BUFFER 360
440
TO OUTPUT BUFFER 700
440
DATA MOVER 470
INTERFACE LOGIC 472
STATE MACHINE 474
COMMAND TABLE 500
TMC0 450a
CONTEXT MEMORY 430
LOCAL MEMORY 434
IRAM 420
TMC1 450b
MMU 460b
CONTROL REGISTERS 410
TMC0 450a
MMU 460a
IRAM 420
TO EXTERNAL MEMORY CONTROLLER A 375a
TO EXTERNAL MEMORY CONTROLLER B 375b

FIG. 4

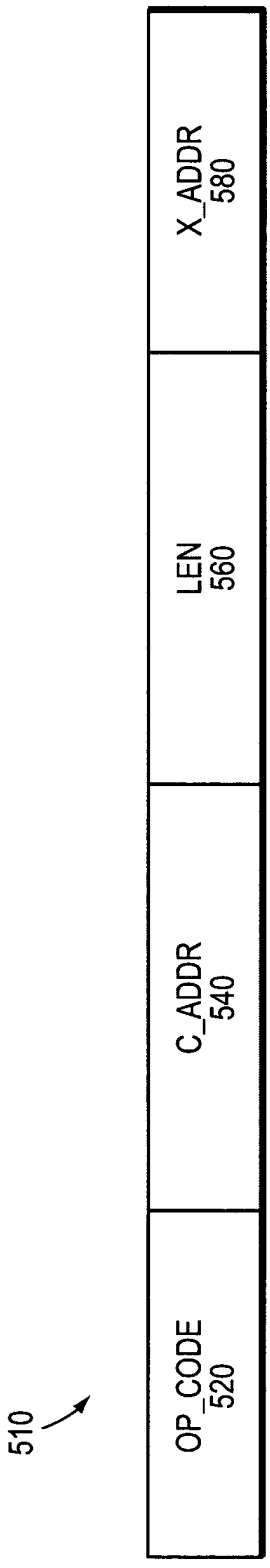
510
OP_CODE
520
C_ADDR
540
LEN
560
X_ADDR
580

FIG. 5

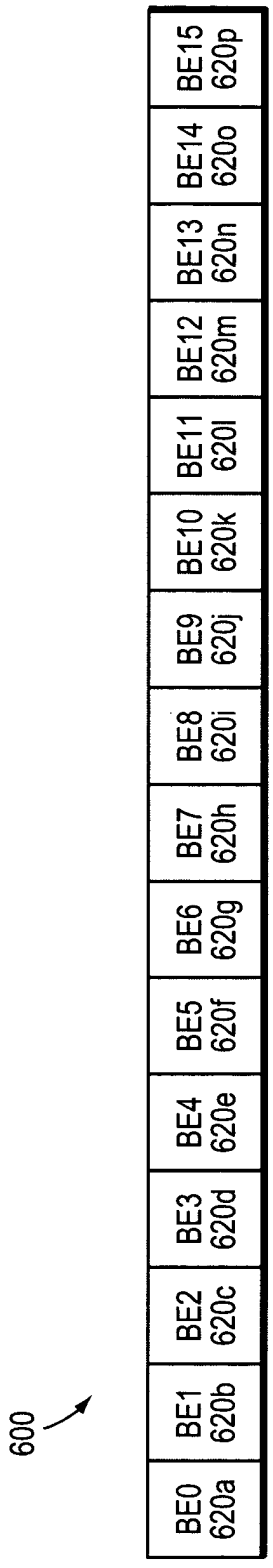
600
BE0
620a
BE1
620b
BE2
620c
BE3
620d
BE4
620e
BE5
620f
BE6
620g
BE7
620h
BE8
620i
BE9
620j
BE10
620k
BE11
620l
BE12
620m
BE13
620n
BE14
620o
BE15
620p

FIG. 6

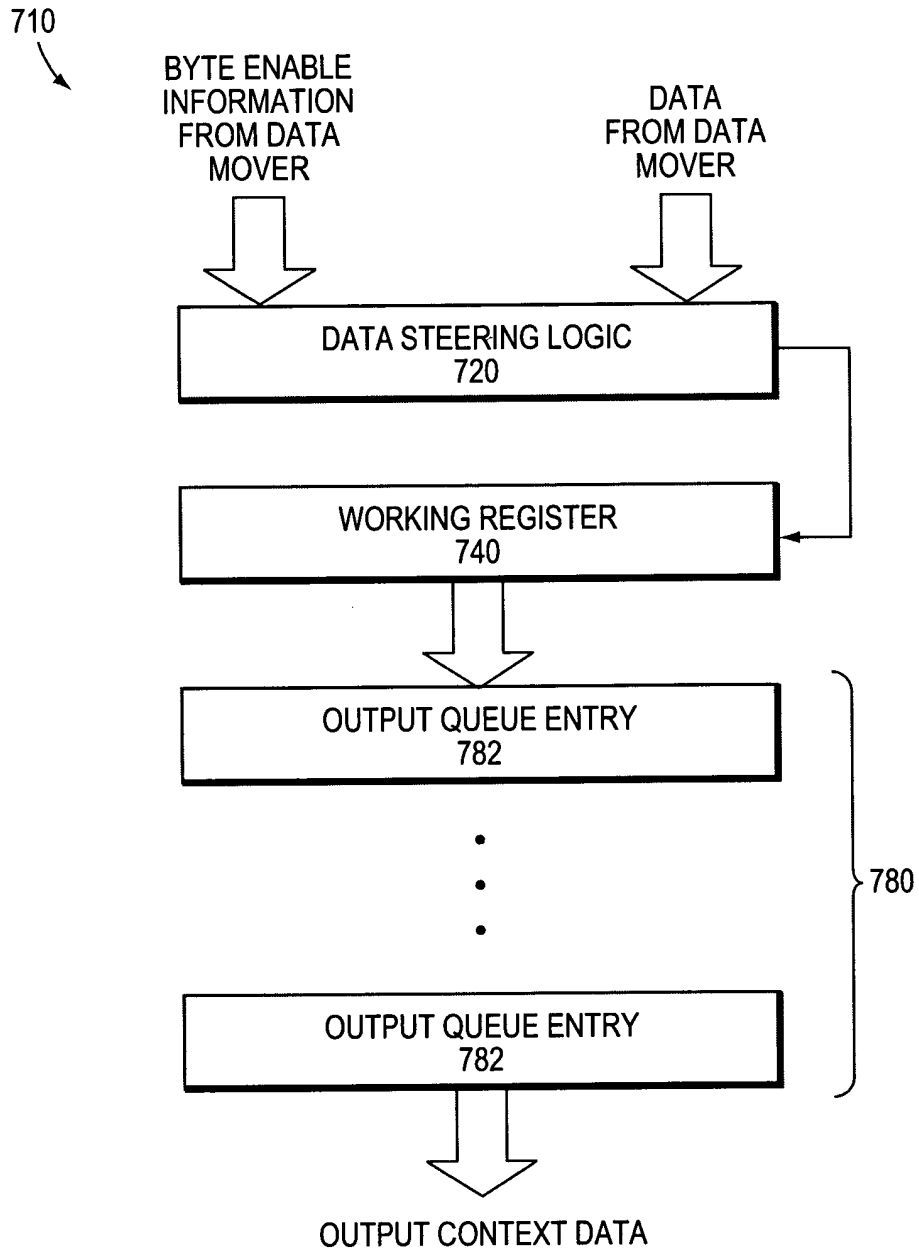
710
BYTE ENABLE INFORMATION FROM DATA MOVER
DATA FROM DATA MOVER
DATA STEERING LOGIC 720
WORKING REGISTER 740
OUTPUT QUEUE ENTRY 782
OUTPUT QUEUE ENTRY 782
780
OUTPUT CONTEXT DATA

FIG. 7

```
810 ——— xcmi   2,110,500    ;insert 2 bytes into ctx loc 110 from addr 500
820 ——— xcmd   2,118        ;delete 2 bytes from ctx loc 118
830 ——— xmt    100,64       ;transmit packet
```

FIG. 8

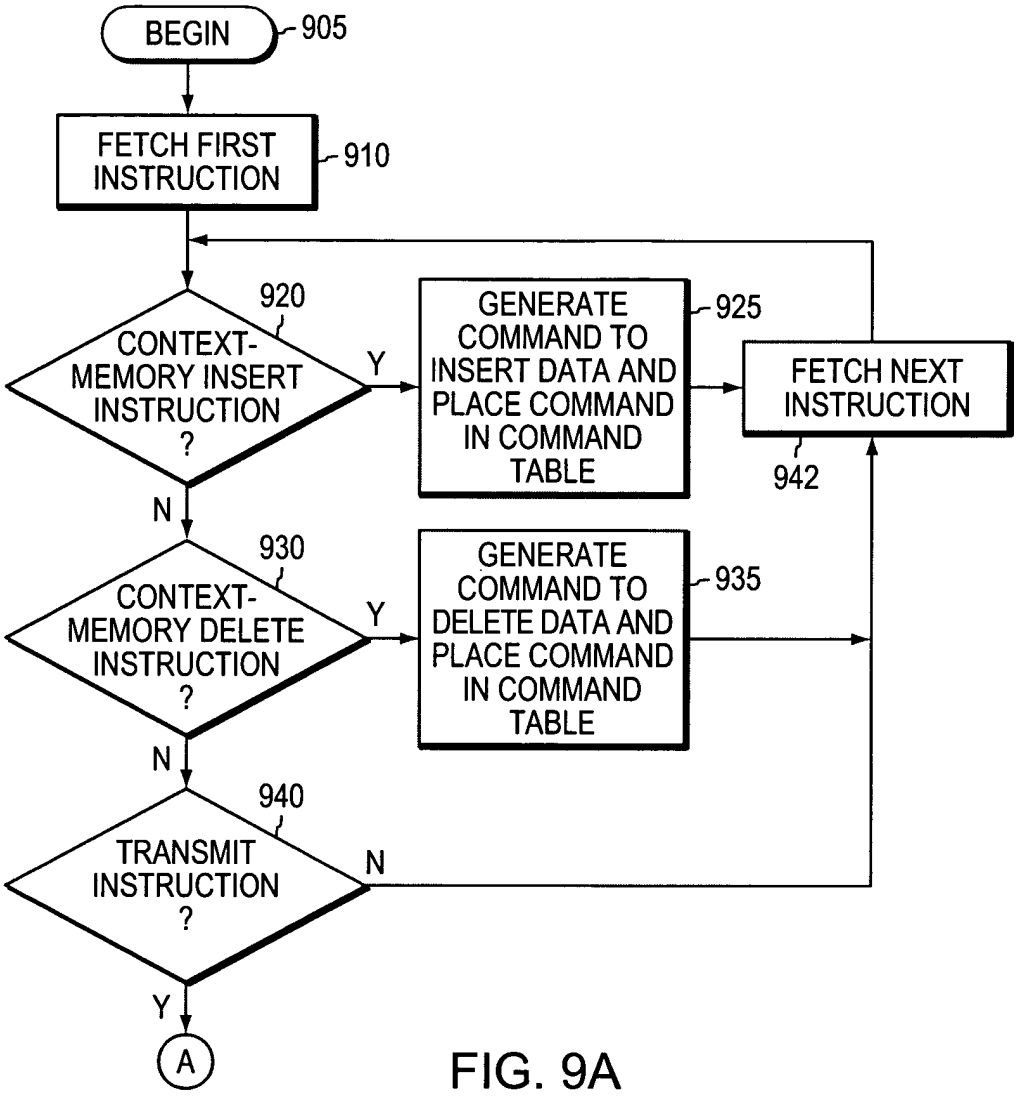
BEGIN
905
FETCH FIRST INSTRUCTION
910
920
CONTEXT-MEMORY INSERT INSTRUCTION ?
Y
GENERATE COMMAND TO INSERT DATA AND PLACE COMMAND IN COMMAND TABLE
925
FETCH NEXT INSTRUCTION
942
N
930
CONTEXT-MEMORY DELETE INSTRUCTION ?
Y
GENERATE COMMAND TO DELETE DATA AND PLACE COMMAND IN COMMAND TABLE
935
N
940
TRANSMIT INSTRUCTION ?
N
Y
A

FIG. 9A

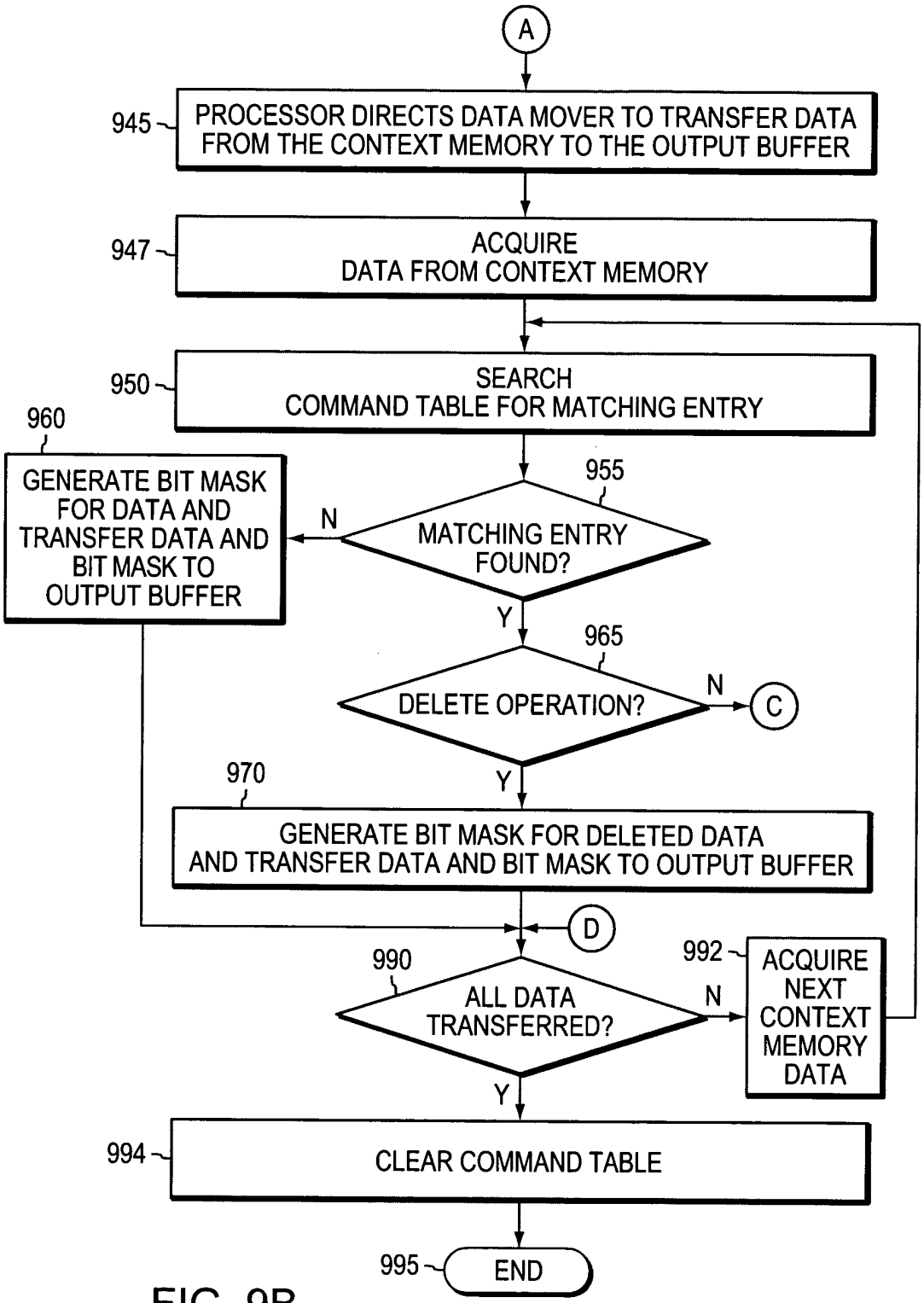
A
945
PROCESSOR DIRECTS DATA MOVER TO TRANSFER DATA FROM THE CONTEXT MEMORY TO THE OUTPUT BUFFER
947
ACQUIRE DATA FROM CONTEXT MEMORY
950
SEARCH COMMAND TABLE FOR MATCHING ENTRY
960
GENERATE BIT MASK FOR DATA AND TRANSFER DATA AND BIT MASK TO OUTPUT BUFFER
955
MATCHING ENTRY FOUND?
N
Y
965
DELETE OPERATION?
N
C
Y
970
GENERATE BIT MASK FOR DELETED DATA AND TRANSFER DATA AND BIT MASK TO OUTPUT BUFFER
D
990
ALL DATA TRANSFERRED?
N
992
ACQUIRE NEXT CONTEXT MEMORY DATA
Y
994
CLEAR COMMAND TABLE
995
END

FIG. 9B

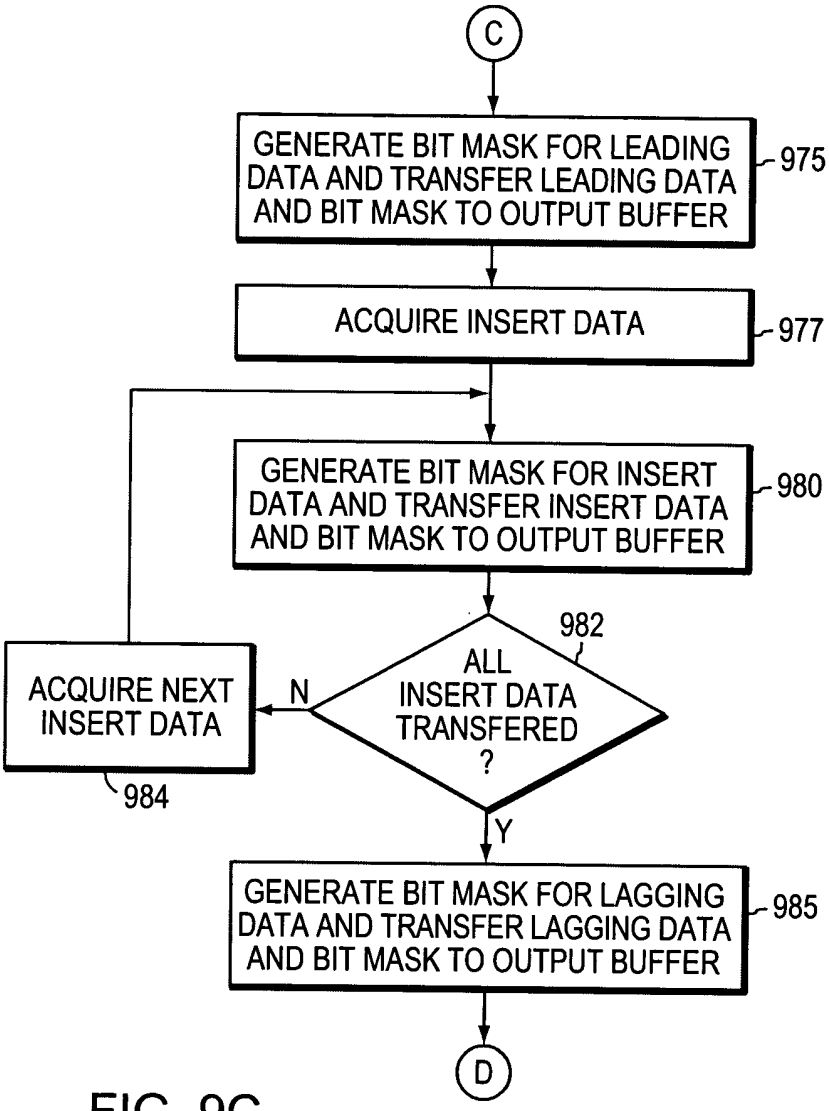
C
GENERATE BIT MASK FOR LEADING DATA AND TRANSFER LEADING DATA AND BIT MASK TO OUTPUT BUFFER
975
ACQUIRE INSERT DATA
977
GENERATE BIT MASK FOR INSERT DATA AND TRANSFER INSERT DATA AND BIT MASK TO OUTPUT BUFFER
980
982
ALL INSERT DATA TRANSFERED ?
N
ACQUIRE NEXT INSERT DATA
984
Y
GENERATE BIT MASK FOR LAGGING DATA AND TRANSFER LAGGING DATA AND BIT MASK TO OUTPUT BUFFER
985
D

FIG. 9C

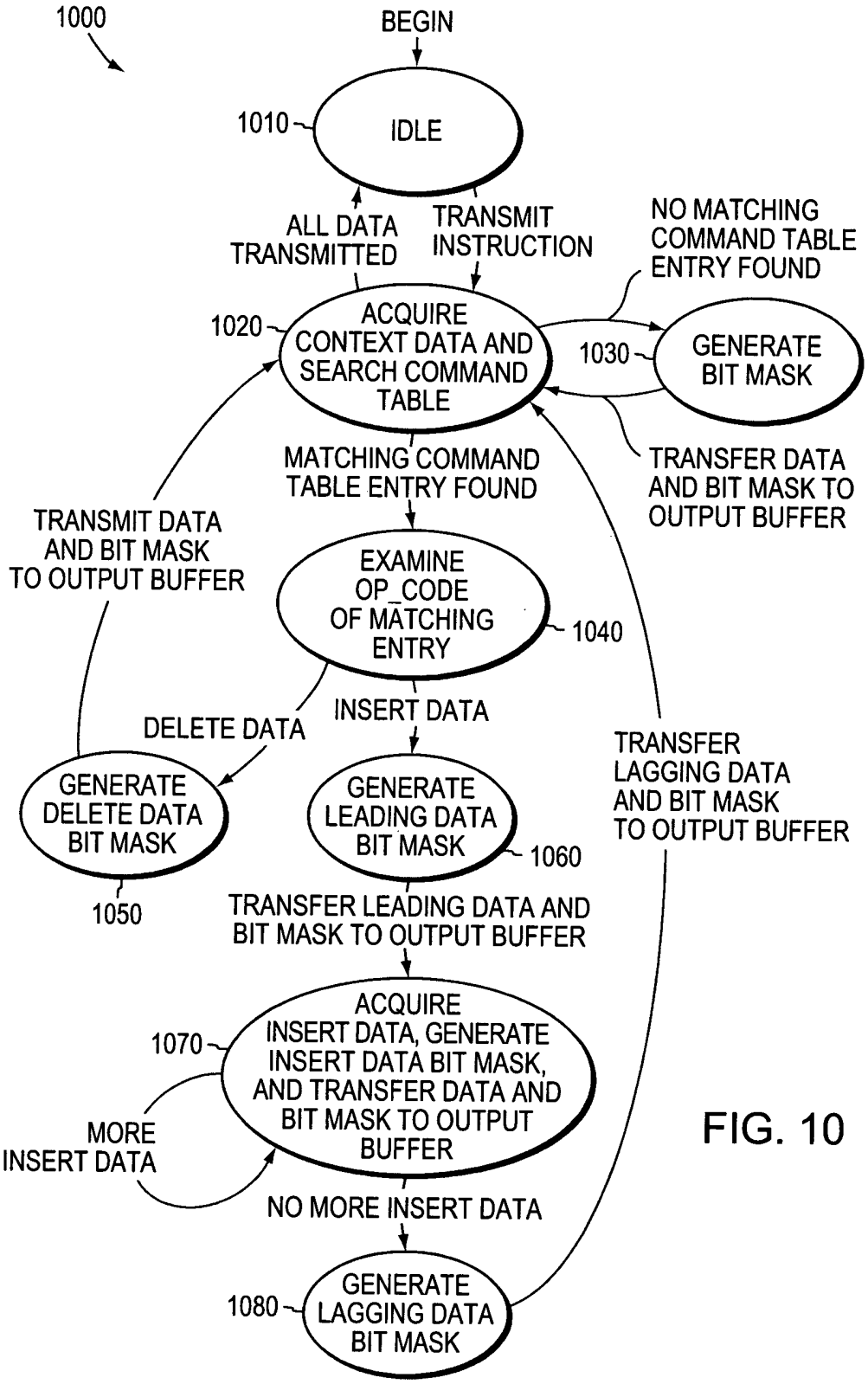
1000
BEGIN
1010
IDLE
ALL DATA TRANSMITTED
TRANSMIT INSTRUCTION
NO MATCHING COMMAND TABLE ENTRY FOUND
1020
ACQUIRE CONTEXT DATA AND SEARCH COMMAND TABLE
1030
GENERATE BIT MASK
TRANSFER DATA AND BIT MASK TO OUTPUT BUFFER
MATCHING COMMAND TABLE ENTRY FOUND
TRANSMIT DATA AND BIT MASK TO OUTPUT BUFFER
EXAMINE OP_CODE OF MATCHING ENTRY
1040
DELETE DATA
INSERT DATA
TRANSFER LAGGING DATA AND BIT MASK TO OUTPUT BUFFER
GENERATE DELETE DATA BIT MASK
1050
GENERATE LEADING DATA BIT MASK
1060
TRANSFER LEADING DATA AND BIT MASK TO OUTPUT BUFFER
1070
ACQUIRE INSERT DATA, GENERATE INSERT DATA BIT MASK, AND TRANSFER DATA AND BIT MASK TO OUTPUT BUFFER
MORE INSERT DATA
NO MORE INSERT DATA
1080
GENERATE LAGGING DATA BIT MASK

FIG. 10